Pure Quadrupole Spectra of Bromine Compounds. (I)

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The resonant r-f absorptions resulting from transitions between levels of the nuclear electric quadrupole splitting in Br^{79} and Br^{81} have been observed on bromobezene and benzylbromide. The spectrometer used in this investigation is of superregeneratitve type. Namely, the detector consists of a frequency modulated and externally quenched oscillator, the frequency modulation being at 60 c.p.s. The detected signals are amplified and displayed on an oscilloscope. The sample sealed in an ampoule is inserted in the coil which terminates the Lecher line tank circuit of the detector oscillator. In order to solidify the sample, it is immersed in a bath containing petroleum ether and dry ice. This spectrometer has a workable range of 150 Mc/s to 400 Mc/s. The frequency measurements are made with a heterodyne wave meter.

The results are shown in the following table:

Compound	Nucleus	Frequency (Mc/s)	eqQ (Mc/s)
C_6H_5Br	Br^{79}	265.10±0.05	530.2
	Br^{81}	221.50±0.05	443.0
$C_6H_5CH_2Br$	Br^{79}	255.82±0.02	511.6
	Br^{81}	213.78±0.02	427.5

where the values of eqQ are calculated, assuming that the asymmetry parameters are zero. The resonance frequencies of C_6H_5Br are slightly different from those measured by S. Kojima and others[1]. These differences are probably caused by the temperature difference, because the coolant used in the present measurements was different from that used by S. Kojima.

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REFERENCE

(1) S. Kojima, T. Tsukada, S. Ogawa, and A. Shimauchi, *J. Chem. Phys.* **21**, 1415 (1953).

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